Operating Systems and Languages Library

GW-BASIC SUPPORT FOR THE OEC

olivetti

PREFACE

This manual provides information for the user to utilize the graphics capabilities of an Olivetti EGA Controller (OEC) via GW-BASIC.

SUMMARY

There are three statements which make use of the enhanced graphics capabilities of the OEC. Two of the statements, COLOR and SCREEN, are extensions of existing statements, the other, PALETTE, is provided specifically for use with enhanced graphics. Each of the statements is described with the syntax for use with the OEC, the user who does not have the OEC installed should refer to the "MS GW-BASIC Interpreter User Guide" for information on all graphics statements.

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INTRODUCTION

There are three statements which make use of the enhanced graphics capabilities of the OEC. Two of the statements, COLOR and SCREEN, are extensions of existing statements, the other, PALETTE, is provided specifically for use with enhanced graphics. Each of the statements is described in this manual with the syntax for use with the OEC, the user who does not have the OEC installed should refer to the "MS GW-BASIC Interpreter User Guide" for information on all graphics statements.

COLOR STATEMENT

Sets the display colors.

For Screen Mode 0:

COLOR [*foreground*][, [*background*][, *dummy*]]

For Screen Mode 1:

COLOR [*background*][, [*palette*]]

For Screen Modes 2 and 3:

COLOR [*foreground*]

For Screen Modes 7, 8, and 9:

COLOR [*foreground* **][,[** *background* **]]**

Characteristics

The use of the COLOR statement and its syntax for the various modes are explained below.

Screen Mode 0

Modifies the current default text foreground and background colors. The *foreground* color must be an integer expression in the range 0-31. It is used to determine the "foreground" color in text mode, which is the default color of text. Sixteen colors can be selected with the integers 0-15. A blinking version of each color can be selected by adding 16 to the color number, for example blinking color 7 is equal to 7 + 16 or 23. The *background* color must be an integer expression in the range 0-7, and is the color of the background for each text character. Blinking background colors are not permitted. If no parameters are specified, then the default color for foreground is white (7) and background is black (0).

The colors corresponding to the integer values are the following:

0	Black	8	Gray
1	Blue	9	Light Blue
2	Green	10	Light Green
3	Cyan	11	Light Cyan
4	Red	12	Light Red
5	Magenta	13	Light Magenta
6	Yellow	14	Light Yellow
7	White	15	High-intensity White

Screen Mode 1

In this mode the COLOR statement has a unique syntax that includes a *palette* parameter that is an odd or even integer expression. This argument determines which set of display colors to use when displaying particular color numbers. The default color settings for the *palette* parameter are equivalent to the following:

```
COLOR, 0        'Same as the next three PALETTE statements
PALETTE 1,2     'Attribute 1 = color 2 (green)
PALETTE 2,4     'Attribute 2 = color 4 (red)
PALETTE 3,6     'Attribute 3 = color 6 (yellow)

COLOR, 1        'Same as the next three PALETTE statements
PALETTE 1,3     'Attribute 1 = color 3 (cyan)
PALETTE 2,5     'Attribute 2 = color 5 (magenta)
PALETTE 3,7     'Attribute 3 = color 7 (white)
```

Note that a COLOR statement will override previous PALETTE statements.

Screen Mode 2

Assigns one of sixteen colors to the foreground color. The *foreground* must be an integer expression in the range 0-15, corresponding to the colors given above in the description of Screen Mode 0. Using the PALETTE statement, however, any of the 16 colors may be independently assigned to the background and foreground (attributes 0 and 1, respectively). Only two colors can be displayed at a time.

Screen 3

Assigns one of sixteen colors to the foreground color. The *foreground* must be an integer expression in the range 0-15, corresponding to the colors given above in the description of Screen Mode 0. The background is black. In this mode there is no enhanced graphics functionality and the PALETTE statement is not supported.

Screen Modes 7-9

In these modes the graphics background is given by the *background* color number, which must be in the valid range of color numbers appropriate to the screen mode. See the SCREEN and PALETTE statements for more details. The default line drawing color is specified by the *foreground* parameter.

The foreground color may be the same as the background color, making displayed characters invisible. The default background color is black, or color number 0, for all screen modes.

The PALETTE statement gives you flexibility in assigning different display colors to the actual color number ranges for the *foreground* and *background* colors. See the PALETTE statement later in this document for more details.

Possible Errors

Parameters outside valid numeric ranges result in "Illegal function call" error messages.

Examples

The following series of examples show COLOR statements and their effects in the various screen modes.

```
SCREEN 0
COLOR 1,2          'foreground 1, background 2

SCREEN 1
COLOR 1,0          'foreground 1, even palette number
COLOR 2,1          'foreground 2, odd palette number

SCREEN 2
COLOR 4            'foreground 4

SCREEN 3
COLOR 3            'foreground 3

SCREEN 7
COLOR 3,5          'foreground 3, background 5

SCREEN 8
COLOR 6,7          'foreground 6, background 7

SCREEN 9
COLOR 1,2          'foreground 1, background 2
```

PALETTE STATEMENT

Changes one or more of the colors in the palette.

PALETTE [*attribute, color* **]**

PALETTE USING *arrayname* **(** *arrayindex* **)**

Characteristics

A palette contains a set of colors with each color specified by an *attribute.* Each *attribute* is paired with an actual display *color* . This *color* determines the actual visual color on the screen, and is dependent on the setting of your screen mode.

PALETTE with no parameters sets the palette to a known initial setting. This setting is the same as the setting when colors are first initialized.

If parameters are given, *color* will be displayed whenever *attribute* is specified in any statement that uses a color. Any color changes on the screen occur immediately. Note that when graphics statements use *color* parameters, they are actually referring to attributes and not actual colors. PALETTE pairs attributes with actual colors.

For example, assume that the current palette consists of colors 0, 1, 2 and 3. The following DRAW statement:

```
DRAW"C3L100"
```

selects attribute 3, and draws a line of 100 pixels using the color associated with the attribute 3, in this case, also 3. If the statement

```
PALETTE 3,2
```

is executed, then the color associated with attribute 3 is changed to color 2. All text or graphics currently on the screen displayed using attribute 3 are instantaneously changed to color 2. All text or graphics subsequently displayed with attribute 3 will also be displayed in color 2. The new palette of colors will contain 0, 1, 2, 2.

With the USING option, all entries in the palette can be modified in one PALETTE statement. The *arrayname* parameter is the name of an integer array and the *arrayindex* specifies the index of the first array element in the *arrayname* to use in setting your palette. Each *attribute* in the palette is consecutively assigned to the respective *color* in the array. If the *color* parameter in an array entry is -1, then the mapping for the associated *attribute* is not changed. All other negative numbers are illegal values for *color*.

You can use the color parameter in the COLOR statement to set the default text color. (Remember that color arguments in other statements are actually what are called *attributes* in this discussion.) This color argument specifies the way that text characters appear on the display screen. Under a common initial palette setting, points colored with *attribute* 0 appear as black on the display screen. Using the PALETTE statement, you could, for example change the mapping of *attribute* 0 from black to white.

Remember, that a PALETTE statement executed without any parameters will assign all *attributes* to their default *colors*.

The following tables give *attribute* and *color* ranges and defaults for the various screen modes.

SCREEN MODE	ATTRIBUTE RANGE	COLOR RANGE
0	0-15	0-31
1	0-3	0-15
2	0-1	0-15
3	NA	0-15
7	0-15	0-15
8	0-15	0-15
9	0-15	0-63

Tab. 1-1 Attribute and Color Ranges for Screen Modes

ATTRIBUTE VALUE FOR MODE			#	COLOR
1	2,3	0,7,8,9		
0	0	0	0	BLACK
		1	1	BLUE
		2	2	GREEN
		3	3	CYAN
		4	4	RED
		5	5	MAGENTA
		6	6	YELLOW
		7	7	WHITE
		8	8	GRAY
		9	9	LIGHT BLUE
		10	10	LIGHT GREEN
1		11	11	LIGHT CYAN
		12	12	LIGHT RED
2		13	13	LIGHT MAGENTA
		14	14	LIGHT YELLOW
3	1	15	15	HIGH-INTENSITY WHITE

Tab. 1-2 Default Attributes and Colors for Screen Modes

Note that colors in the range 16-31 are blinking versions of colors 0-15.

Examples

The following changes all points colored with *attribute* 0 to *color* 2:

```
PALETTE 0,2
```

This does not modify the palette.

```
PALETTE 0, -1
```

The following changes each palette entry. All *attributes* are now mapped to display color zero (since the array is initialized to zero when it is first declared).

```
PALETTE A%(0)
```

The screen will appear as one single color. However, it will still be possible to execute any GW-BASIC statement.

The following example sets each palette entry to its appropriate initial display color:

```
PALETTE
```

SCREEN STATEMENT

Sets the Screen Mode.

SCREEN [*mode* **][,[** *burst* **]][,[** *apage* **]][,[** *vpage* **]]**

Characteristics

The *mode* parameter is an integer expression with legal values 0, 1, 2, 3, 7, 8 and 9. Other values are illegal.

Each of the Screen Modes is described in the following paragraphs.

SCREEN 0

- Text Mode only
- Either 40 x 25 or 80 x 25 text format with character box size of 8 x 14
- Assignment of 16 colors to any of 16 attributes

SCREEN 1

- 320 x 200 pixel medium resolution graphics
- 80 x 25 text format with character box size of 8 x 8
- Assignment of 16 colors to any of 4 attributes

SCREEN 2

- 640 x 200 pixel high resolution graphics
- 40 x 25 text format with character box size of 8 x 8
- Assignment of 16 colors to any of 2 attributes

SCREEN 3

- 640 x 400 pixel super resolution graphics
- 80 x 25 text format with character box size of 8 x 8
- Assignment of 16 colors to foreground

SCREEN 7

- 320 x 200 pixel medium resolution graphics
- 40 x 25 text format with character box size of 8 x 8
- 8 display pages
- Assignment of 16 colors to 16 attributes

SCREEN 8

- 640 x 200 pixel high resolution graphics
- 80 x 25 text format with character box size of 8 x 8
- 4 display pages
- Assignment of any of 16 colors to 16 attributes

SCREEN 9

- 640 x 350 pixel enhanced resolution graphics
- 80 x 25 text format with character box size of 8 x 14
- Assignment of any of 64 colors to 16 attributes
- 2 display pages

For composite monitors and TVs, the *burst* parameter is a numeric expression that is either true (non-zero) or false (zero). A value of zero disables color and permits display of black and white images only. A non-zero value permits color.

The *apage* and *vpage* parameters determine the active and visual memory pages. The active page is the area in memory where graphics statements are written, the visual page is the area of memory that is displayed on the screen.

Animation can be achieved by alternating display of graphics pages. The goal here is to display the already completed graphics output on the visual page, while executing graphics statements in one or more active pages. A page is displayed only when graphics output to that page is complete. Thus the following is typical:

```
SCREEN 7,, 1, 2        'work in page 1, show page 2
.
.      Graphics output to page 1
.      while viewing page 2
.
SCREEN 7,, 2, 1        'work in page 2, show page 1
.
.      Graphics output to page 2
.      while viewing page 1
.
```

The number of pages available depends on the Screen Mode, as described in the following table.

MODE	RESOLUTION	ATTRIBUTE RANGE	COLOR RANGE	PAGES	PAGE SIZE
0	40 column text	0-15	0-31	8	2K
	80 column text	0-15	0-31	4	4K
1	320 x 200	0-3	0-15	1	16K
2	640 x 200	0-1	0-15	1	16K
3	640 x 400	NA	0-15	1	32K
7	320 x 200	0-15	0-15	8	32K
8	640 x 200	0-15	0-15	4	64K
9	640 x 350	0-15	0-63	2	128K

Tab. 1-3 Screen Mode Specifications

Note that colors in the range 16-31 are blinking versions of the colors 0-15.

Different attribute and color settings exist. (See the PALETTE statement for a discussion of attribute and color number.)

NOTICE

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